Safety Criterion: 4.5 - 5

Redundant Safety Design Class systems and components should be in separate fire areas.

Redundant, primary and secondary, fire protection systems shall be provided in areas where Safety Design Class systems and components are vulnerable to fire damage and where no redundant safety capability exists outside of the fire area.

Implementing Codes and Standards:

DOE G-440.1 Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program
DOE-STD-1066-97 Fire Protection Design Criteria
NFPA 801-95 Standard for Facilities Handling Radioactive Materials

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Safety Criterion: 4.5 - 6

The design shall incorporate life safety features including means to notify and evacuate building occupants in the event of a fire, such as a fire detection or fire alarm system and illuminated, protected egress paths.

Implementing Codes and Standards:

DOE G-440.1 Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program
DOE-STD-1066-97 Fire Protection Design Criteria
NFPA 801-95 Standard for Facilities Handling Radioactive Materials

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Safety Criterion: 4.5 - 7

The facility shall include a fire detection system to detect the presence of a fire and activate alarm systems so that measures for confinement and suppression of the fire and personnel evacuation may start promptly. The detection system shall include a means to summon the Hanford Site fire department. The system shall be capable of operation without offsite power.

Implementing Codes and Standards:

DOE G-440.1 Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program
DOE-STD-1066-97 Fire Protection Design Criteria
NFPA 801-95 Standard for Facilities Handling Radioactive Materials

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Safety Criterion: 4.5 - 8

The facility shall include physical access and appropriate equipment to facilitate effective intervention by the Hanford Site fire department, such as an interior standpipe system.

Implementing Codes and Standards:

DOE G-440.1 Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program
DOE-STD-1066-97 Fire Protection Design Criteria
NFPA 801-95 Standard for Facilities Handling Radioactive Materials

~~BNFL-5193-ISP-01 TWRS-P Project Integrated Safety Management Plan~~
~~Section: 3.10 Emergency Preparedness~~

Safety Criterion: 4.5 - 13

The fire protection program and features shall be characterized by a level of fire protection that is sufficient to fulfill the requirements of the best protected class of industrial risks ("Highly Protected Risk" or "Improved Risk") and shall be provided protection to achieve "defense-in-depth."

Implementing Codes and Standards:

DOE G-440.1 Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program
DOE-STD-1066-97 Fire Protection Design Criteria
NFPA 801-95 Standard for Facilities Handling Radioactive Materials

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Safety Criterion: 4.5 - 14

A fire protection program shall be developed that will minimize the potential for the occurrence of a fire or explosive threat and, should such an event occur, the program will limit:
(1) Radiological and hazardous releases from the facility;
(2) The threat to the health and safety of facility workers; and
(3) Interruption of the facility mission to process tank waste.

Implementing Codes and Standards:

DOE G-440.1 Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program
DOE-STD-1066-97 Fire Protection Design Criteria
NFPA 801-95 Standard for Facilities Handling Radioactive Materials

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Safety Criterion: 4.5 - 15

The fire protection program will include:
(1) organization, training, and responsibilities of the fire protection staff, including a trained and equipped fire brigade;
(2) inspection, testing, and maintenance of all fire protection systems by personnel properly qualified by experience and training in fire protection systems;
(3) surveillance to ensure that fire barriers are in place and that fire suppression systems and components are operable;
(4) training of all employees in basic fire safety; and
(5) periodic performance of fire drills.

Implementing Codes and Standards:

DOE G-440.1 Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program
NFPA 801-95 Standard for Facilities Handling Radioactive Materials

~~BNFL-5193-ISP-01 TWRS-P Project Integrated Safety Management Plan~~
~~Section: 3.15 Training and Qualification~~
~~Chapter: 11.0 Organization Roles, Responsibilities and Authorities~~
~~Section: 1.3.9 Quality Assurance Program~~
~~Section: 3.10 Emergency Preparedness~~

Safety Criterion: 4.5 - 16

The fire protection program will include a plan to identify, prioritize and monitor the status of fire protection-related appraisal findings/recommendations until final resolution is achieved. When final resolution will be significantly delayed, appropriate interim compensatory measures shall be implemented to minimize the fire risk.

Implementing Codes and Standards:

DOE G-440.1 Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program
NFPA 801-95 Standard for Facilities Handling Radioactive Materials

~~BNFL-5193-ISP-01 TWRS-P Project Integrated Safety Management Plan~~
~~Chapter: 10.0 Assessments~~

Safety Criterion: 4.5 - 17

The fire protection program shall ensure fire protection requirements are documented and incorporated in the plans and specifications for all new facilities and for significant modifications of existing facilities. This includes a documented review by a qualified fire protection engineer of plans, specifications, procedures, and acceptance tests.

Implementing Codes and Standards:

DOE G-440.1 Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program
DOE-STD-1066-97 Fire Protection Design Criteria
NFPA 801-95 Standard for Facilities Handling Radioactive Materials

~~BNFL-5193-ISP-01 TWRS-P Project Integrated Safety Management Plan~~
~~Chapter: 8.0 Document Control and Maintenance~~
~~Section: 1.3.16 Configuration Management~~

Safety Criterion: 4.5 - 18

The fire protection program shall include a comprehensive, documented fire protection self-assessment program, which includes all aspects (program and facility) of the fire protection program.

Implementing Codes and Standards:

DOE G-440.1 Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program
NFPA 801-95 Standard for Facilities Handling Radioactive Materials

~~BNFL-5193-ISP-01 TWRS-P Project Integrated Safety Management Plan~~
~~Chapter: 10.0 Assessments~~

Safety Criterion: 4.5 - 19

Administrative controls shall be established to minimize fire hazards. These shall include procedures to:
(1) govern the handling and storage of combustible and flammable materials;
(2) govern the handling of transient fire loads in buildings containing Safety Design Class SSCs;
(3) designate staff members responsible for fire protection review of proposed work activities;
(4) govern the use of ignition sources (e.g., through the use of a flame permit system);
(5) control the expedient removal of combustibles resulting from work activities;
(6) establish compensatory controls for activities which may result in the impairment of fire prevention and/or mitigation features; and
(7) maintain periodic housekeeping inspections to ensure continued compliance with these administrative controls.

Implementing Codes and Standards:

DOE G-440.1 Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program
NFPA 801-95 Standard for Facilities Handling Radioactive Materials

Safety Criterion: 4.5 - 20

A Fire Hazard Analysis (FHA) of the facility shall be performed. Such a systematic analysis shall divide the facility into "fire areas" and evaluate the fire safety of each area and of the facility as a whole. The analysis shall, for each fire area:
(1) Account for all radioactive, hazardous, and combustible materials, including estimates of their heat content;
(2) Describe the processes performed and their potential for fire or explosion;
(3) Account for the sources of heat and flame;
(4) List the fire detection and suppression equipment; and
(5) Consider credible fire scenarios and evaluate the adequacy of the fire protection measures.

In addition, the FHA shall consider other buildings or installations close to process buildings that contain flammable, combustible, or reactive liquid or gas storage.

The FHA shall confirm that the facility can be placed in a safe state during and after all credible fire and explosion conditions.

Implementing Codes and Standards:
DOE G-440.1 Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program
DOE-STD-1066-97 Fire Protection Design Criteria
NFPA 801-95 Standard for Facilities Handling Radioactive Materials

~~BNFL-5193-ISP-01 TWRS-P Project Integrated Safety Management Plan~~
~~Section: 4.2.3.1 Safety Analysis Reports~~

Safety Criterion: 4.5 - 21

The fire protection program shall be under the direction of an individual who has been delegated authority commensurate with the responsibilities of the position and who has available staff knowledgeable in both fire protection and nuclear safety.

Implementing Codes and Standards:
DOE G-440.1 Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program
NFPA 801-95 Standard for Facilities Handling Radioactive Materials

~~BNFL-5193-ISP-01 TWRS-P Project Integrated Safety Management Plan~~
~~Section: 4.2.3.1 Safety Analysis Reports~~

Safety Criterion: 4.5 - 22

The facility should have on file, and ready to use, a Pre-Fire Plan. The Pre-Fire Plan should assign individual and alternate responsibilities for responding to a fire alarm or call; assessing the situation, suppressing incipient fires, assembling the site Fire Brigade, and if necessary, requesting Hanford Site fire department assistance, personnel evacuation, orderly shutdown of processes, and safeguarding (if necessary) and control of radioactive and hazardous material.

The plan should clearly indicate, preferably with the help of site plans and drawings, the locations of the fire department-compatible connections and fire-fighting equipment, such as portable extinguishers, automatic fire suppression systems, sectional valves, standpipes, hydrants, and hoses. It should also indicate the areas of concentrations of combustibles, storages of flammable and combustible liquids, and areas where use of water for fire suppression is restricted because of nuclear criticality or other concerns.

The Pre-Fire Plan should be prepared in consultation and coordination with the Hanford Site fire department. The Hanford Site fire department personnel should be given familiarization tours of the facility at least once a year.

Implementing Codes and Standards:

DOE G-440.1 Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program
NFPA 801-95 Standard for Facilities Handling Radioactive Materials

~~BNFL-5193-ISP-01 TWRS-P Project Integrated Safety Management Plan~~
~~Section: 4.2.3.1 Safety Analysis Reports~~

Safety Criterion: 4.5 - 23

Hot work permits shall be issued for hot work operations conducted in or near the facility. The permit shall document that applicable fire prevention and protection requirements have been implemented prior to beginning the hot work operations; it shall indicate the date(s) authorized for hot work; and identify the object on which hot work is to be performed. The permit shall be kept on file until completion of the hot work operations.

Implementing Codes and Standards:

DOE G-440.1 Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program
NFPA 801-95 Standard for Facilities Handling Radioactive Materials

~~BNFL-5193-ISP-01 TWRS-P Project Integrated Safety Management Plan~~
~~Section: 5.6.6 Hot Work Operations~~

Regulatory Basis:

29 CFR 1910 Occupational Safety and Health Standards Location: 119 (k)
DOE/RL-96-0006 5.2.8 Hot Work Control